

Amendments to the claims:

Claims 1-12: (canceled)

Claim 13 (Amended): A method of fabricating a ~~membrane~~ structure comprising:

forming a sacrificial layer over a first surface of a substrate;

forming a silicon layer over the sacrificial layer ~~such that the silicon layer has a grain structure including grains defining pores therebetween wherein the maximum diameter of any one grain does not exceed the thickness of the membrane structure;~~and

removing the sacrificial layer; and

controlling a residual stress of the silicon layer to insure that the silicon layer has a residual stress within a range of between about -50 to 50 mega-Pascals.

Claim 14 (original): The method of claim 13 further including forming a passageway through the substrate.

Claim 15 (original): The method of claim 13 further including forming a conformal layer over the silicon layer to provide a selected chemical or biological function.

Claim 16 (Amended): A method of fabricating a ~~membrane~~ structure comprising:

forming a sacrificial layer over a surface of a substrate;

forming a structural layer over the sacrificial layer;

forming a silicon layer over the structural layer ~~such that the silicon layer has a grain structure including grains defining pores therebetween wherein the maximum diameter of any one grain does not exceed the thickness of the membrane structure; and~~

removing the sacrificial layer; and

monitoring a residual stress of the silicon layer to insure that the silicon layer has a residual stress within a range of between about -100 to 100 mega-Pascals and a grain structure including grains defining pores therebetween wherein the grains have an approximately hemispherical shape.

Claim 17 (Amended): A method of fabricating a ~~membrane filter~~ structure comprising:

forming a sacrificial layer over a first surface of a substrate; and

growing a silicon film over the sacrificial layer at a temperature near the tensile-to-compressive transition temperature of the silicon film, and controlling a residual stress of the

silicon film such that the silicon film has a residual stress within a range of about -100 to 100 mega-Pascals and a grain structure including a layer of grains defining having an approximately hemispherical shape wherein pores therebetween wherein the maximum diameter of any one grain does not exceed the thickness of the membrane filter structure are defined by gaps between adjacent grains.; and

~~removing the sacrificial layer~~

Claim 18 (original): The method of claim 17 wherein the silicon film is formed under a near zero-stress condition.

Claim 19 (original): The method of claim 17 wherein the silicon film has a residual stress within a range of about -50 to 50 mega-Pascals.

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Claim 20: (canceled).

Claim 21 (original): The method of claim 17 wherein the silicon film is grown such that a lateral dimension of any pore is less than that of any grain.

Claim 22 (original): The method of claim 17 wherein the silicon film is grown such that a lateral dimension of the pores is between about 10 and 50 nanometers.

Claim 23 (original): The method of claim 17 wherein the silicon film is grown such that the thickness of the film is between about 50 and 150 nanometers.

Claim 24 (original): The method of claim 17 wherein the silicon film is grown such that the roughness of the film is approximately equal to its thickness.

Claim 25 (original): The method of claim 17 further including forming a conformal layer on the silicon film to provide a selected chemical or biological function.

Claim 26: (canceled).

Claim 27 (new): The method of claim 17 wherein the silicon film is used to form a membrane filter structure.